

# An Advanced Smoke-Eater for Post-Fire Cabin Atmosphere Cleanup, Phase I

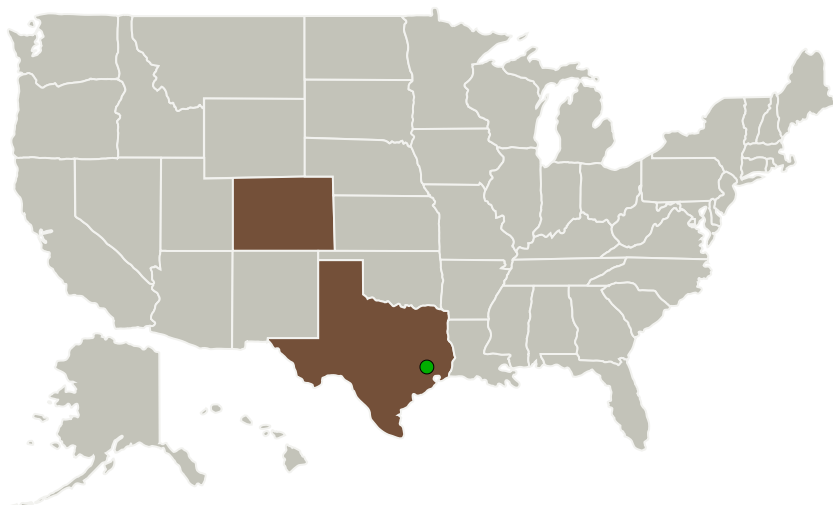
Completed Technology Project (2014 - 2014)




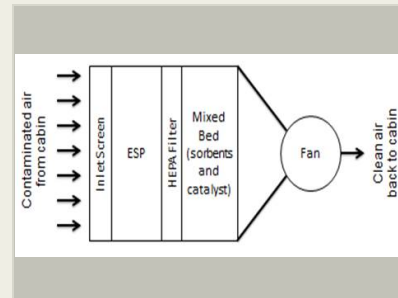
## Project Introduction

TDA Research, Inc. (TDA) proposes to develop a post-fire air purification system that consists of a particulate removal assembly, a sorbent bed to remove the combustion by-products generated by low intensity fires (such as HCN, HCl, SO<sub>2</sub> and NH<sub>3</sub>) and an ambient temperature oxidation catalyst to eliminate any carbon monoxide (CO) and volatile organic compounds (VOCs). The unit will be designed to rapidly restore the cabin air to a safe condition. In Phase I, we will first evaluate the performance of individual components in flow experiments to identify the optimum bed geometry. We will then design a breadboard prototype unit and evaluate its performance in an environmental chamber under representative conditions. We will carry out detailed design of the purification system, integrating the particulate removal assembly, sorbent bed and the ambient temperature oxidation catalyst. We will determine the weight and volume of the unit as well as the energy required to circulate the contaminated cabin air through the purifier.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
TDA Research, Inc.	Lead Organization	Industry	Wheat Ridge, Colorado
 Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas



An Advanced Smoke-Eater for Post-fire Cabin Atmosphere Cleanup Project Image

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## Primary U.S. Work Locations

Colorado

Texas

## Project Transitions



**June 2014:** Project Start

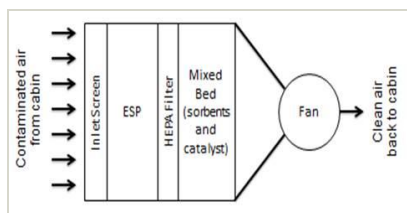


**December 2014:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140542>)

## Images



### Project Image

An Advanced Smoke-Eater for Post-fire Cabin Atmosphere Cleanup

Project Image

(<https://techport.nasa.gov/image/135490>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

TDA Research, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Gokhan Alptekin

### Co-Investigator:

Gokhan O Alptekin

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## Technology Maturity (TRL)

Start: **2**  
Current: **3**  
Estimated End: **3**



## Technology Areas

### Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - └ TX06.1.1 Atmosphere Revitalization

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System